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[54]名 稱：電（氣）動圓穴鋸鑽孔快速接頭結構

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[57]申請專利範圍：

1.一種電(氣)動圓穴鋸鑽孔快速接頭結構，係包含有：
一快拆頭母座，係由外罩座、內基座、彈性元件、限位環、墊圈、套接座組成，外罩座設內孔組設內基座，而內基座階突環前組彈性元件並以限位環迫組於外罩座內孔前周緣而限位住內基座、彈性元件，內基座並設具鋼珠得配合外罩座大小徑內孔控制而對快拆頭公座環凹槽作定位或快拆者；
另套接座以六角孔組合鑽頭六角桿，並鋼珠定位鑽頭環凹溝，鋼珠並為快拆頭公座貫通之圓孔限位；
一快拆頭公座，包含有與圓穴鋸組合之外螺紋、六角桿體與環凹溝，快拆頭公座並設貫通圓孔；
一圓穴鋸，設具組合快拆頭公座之螺孔；
一鑽頭，設具六角桿與其上之環凹溝者；
其中該內基座之內孔設成配合快拆頭公座六角桿體之六角孔，而使其得以順利傳動快拆頭公座、圓穴鋸鑽輕負載或小孔鑽削；
據以利用快拆頭公、母座之快速拆裝更換效果，達其快速更換圓穴鋸、鑽頭之動作，並藉由其組合而達其傳達動力功效者。

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2.一種電(氣)動圓穴鋸鑽孔快速接頭結構，係包含有：
一快拆頭母座，係由外罩座、內基座、彈性元件、限位環、墊圈、套接座組成，外罩座設內孔組設內基座，而內基座階突環前組彈性元件並以限位環迫組於外罩座內孔前周緣而限位住內基座、彈性元件，內基座並設具鋼珠得配合外罩座大小徑內孔控制而對快拆頭公座環凹槽作定位或快拆者；

另套接座以六角孔組合鑽頭六角桿，並鋼珠定位鑽頭環凹溝，鋼珠並為快拆頭公座貫通之圓孔限位；

一快拆頭公座，包含有與圓穴鋸組合之外螺紋、六角桿體與環凹溝，快拆頭公座並設貫通圓孔；

一圓穴鋸，設具組合快拆頭公座之螺孔；

一鑽頭，設具六角桿與其上之環凹溝者；

其中該內基座之內孔設成大於快拆頭公座六角桿體之圓孔，而內基座端面設具對應之凸柱，圓穴鋸端面則設等分四圓孔，凸柱與圓孔之卡組，而使其得以順利傳動快拆頭公座、圓穴鋸鑽重負載或大孔鑽削；

據以利用快拆頭公、母座之快速拆裝更換效果，達其快速更換圓穴鋸、鑽頭之動作，並藉由其組合而達其傳達動力功效者。

圖式簡單說明：

第1圖：係本創作電(氣)動圓穴鋸鑽孔快速接頭其一例立體分解示意圖。

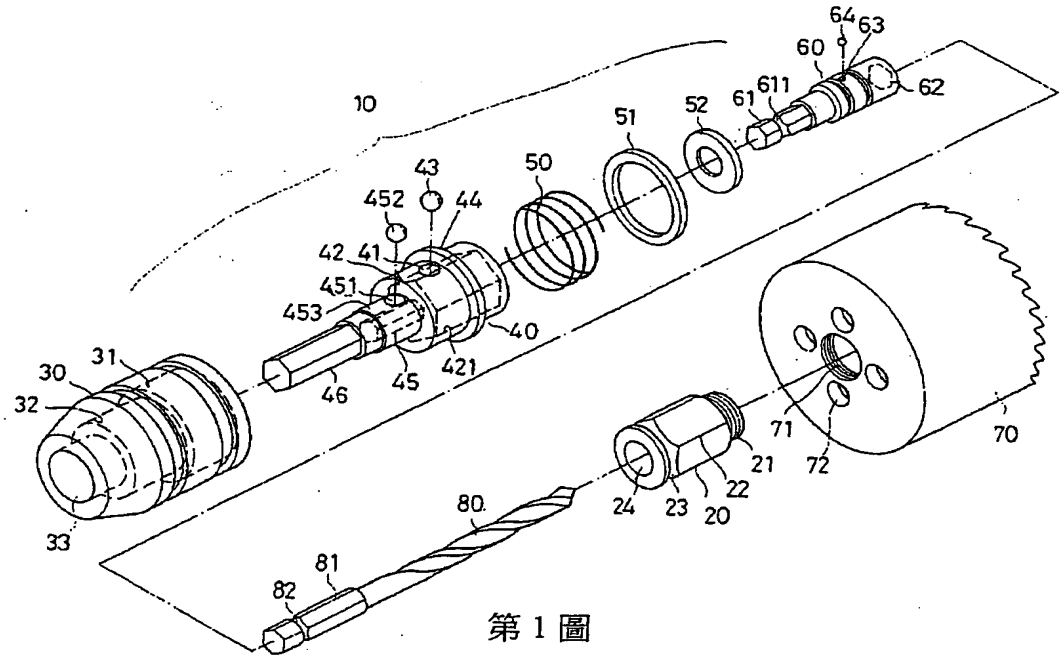
第2圖：係本創作電(氣)動圓穴鋸鑽孔快速接頭其一例快拆頭公、母座快組後剖示圖。

第3圖：係本創作電(氣)動圓穴鋸鑽孔快速接頭其一例快拆頭公、母座快拆後剖示圖。

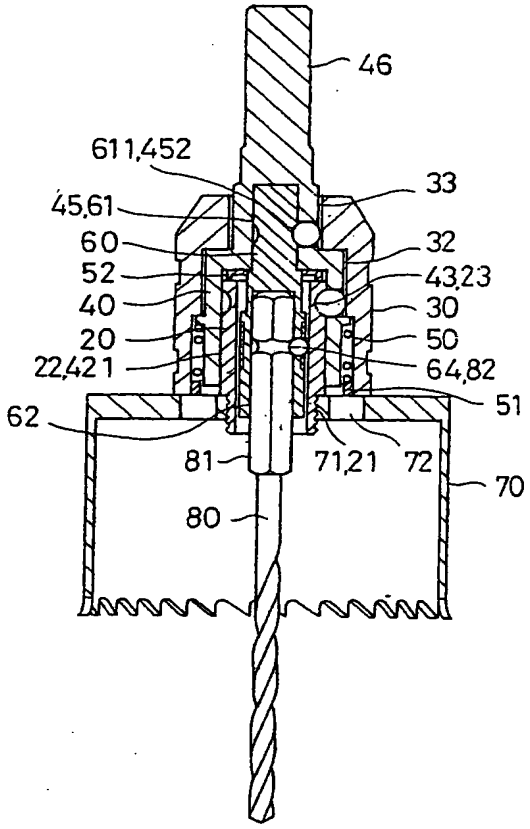
第4圖：係本創作電(氣)動圓穴鋸鑽孔快速接頭另一例立體分解示意圖。

第5圖：係本創作電(氣)動圓穴鋸鑽孔快速接頭另一例快拆頭公、母座快組後剖示圖。

第6圖：係本創作電(氣)動圓穴鋸鑽孔快速接頭另一例快拆頭公、母座快拆後剖示圖。



第 1 圖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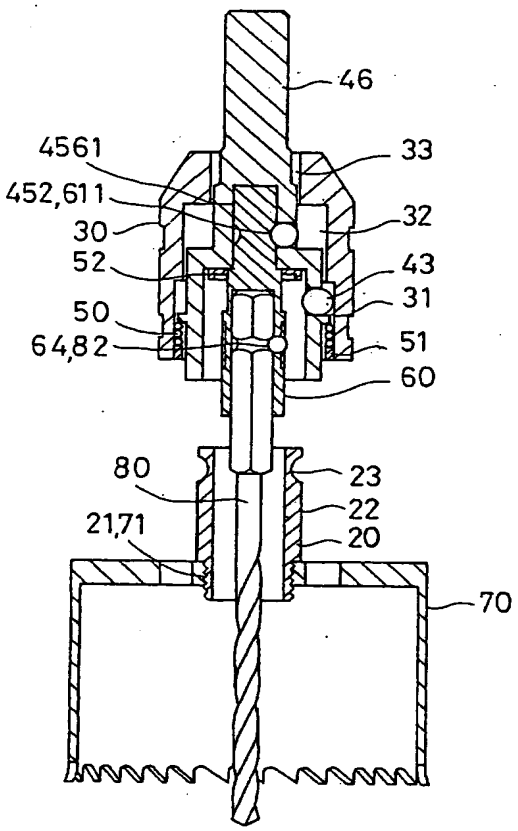
第 2 圖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第 3 圖

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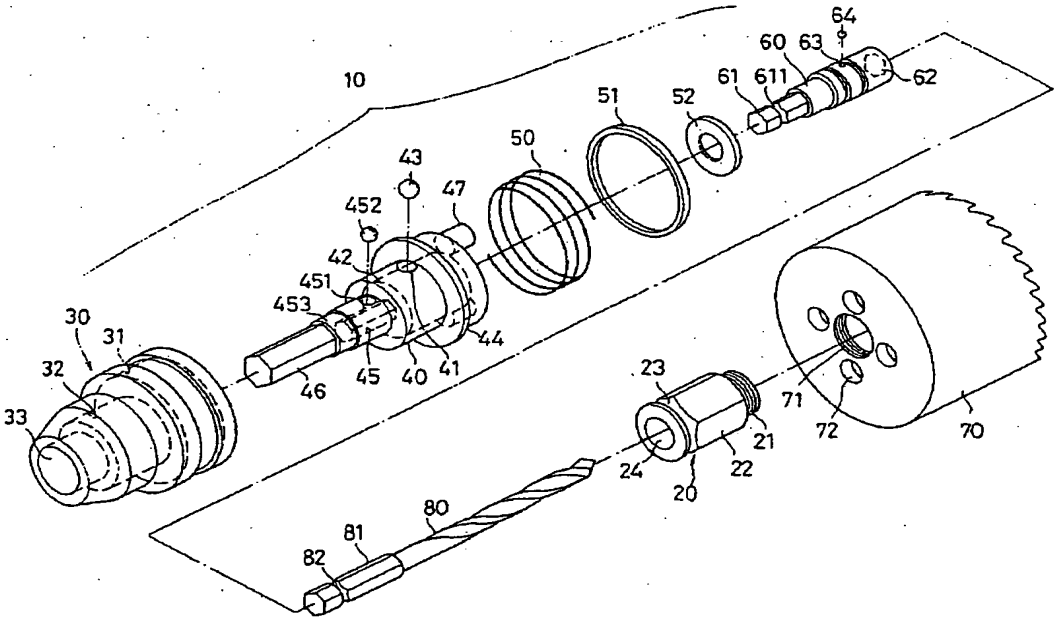
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第 4 圖

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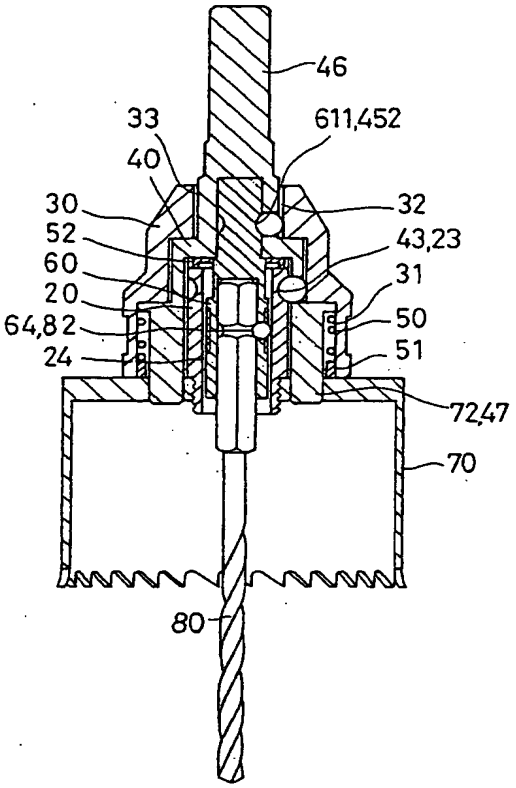
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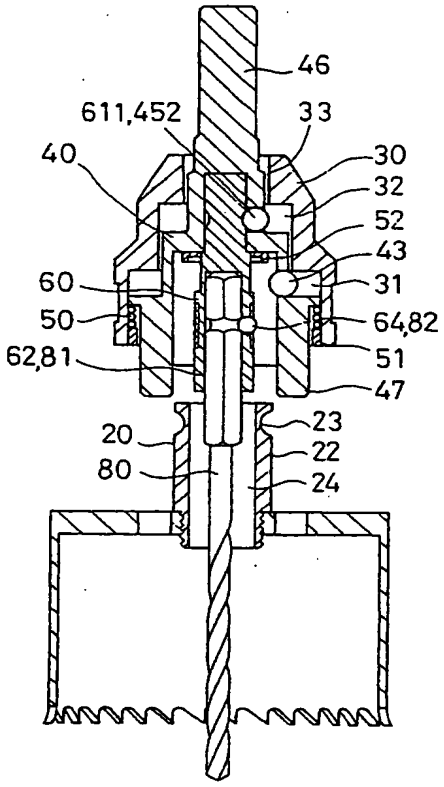
第 5 圖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第 6 圖

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Attorneys-at-Law

Electrical Hole Saw Adaptor Assembly

Technical Field

The present invention relates to an electrical hole saw adaptor assembly, in which a hole saw and a pilot drill bit can be easily dismounted from the adaptor assembly without using special tools. The adaptor assembly comprises a female adaptor, a male adaptor, the pilot drill bit and the hole saw. The female consists of a sleeve, an inner base, a spring member, a retainer ring, a washer and a pilot drill bit adaptor. The male adaptor includes an outer thread for attaching to the hole saw, a hexagon insert bit and an annular access. The male adaptor is also provided with a through hole. The hole saw is provided with a threaded hole to be engaged with the male adaptor. The pilot drill bit has a hexagon insert and an annular groove provided on the hexagon insert. By means of quickly mounting/dismounting the male adaptor to/from the female adaptor, the hole saw and the pilot drill bit can be quickly replaced without using a special tool. By such configuration, the transmission of various power and the drilling of various sizes can be achieved.

Description of the Related Art

Conventional hole saw assembly is integrally formed. When replacing the hole saw, the entire assembly must be dismounted from an electric drill by using a special tool and then the hole saw be dismounted from the entire assembly, thereby wasting in time and cost.

To solve the aforementioned shortcoming, the present inventor has made an electrical hole saw adaptor assembly which allows the hole saw to be mounted and dismounted to and from the electric drill without using a special tool.

Summary of the Invention

The object of the present invention is to provide an electrical hole saw adaptor assembly. The adaptor assembly comprises a female adaptor, a male adaptor, a pilot drill bit and a hole saw. The female consists of a sleeve, an inner base, a spring

member, a retainer ring, a washer and a pilot drill bit adaptor. The male adaptor includes an outer thread for attaching to the hole saw, a hexagon insert bit and an annular access. The male adaptor is also provided with a through hole. The hole saw is provided with a threaded hole to be engaged with the male adaptor. The pilot drill bit has a hexagon insert and an annular groove provided on the hexagon insert. By means of quickly mounting/dismounting the male adaptor to/from the female adaptor, the hole saw and the pilot drill bit can be quickly replaced without using a special tool. By such configuration, the transmission of various power can be achieved.

Brief Description of The Drawings

Figure 1 shows an exploded view of an electrical hole saw adaptor assembly according to a first embodiment of the present invention.

Figure 2 shows a sectional view of the adaptor assembly of Figure 1, in which a male adaptor and a female adaptor are assembled.

Figure 3 shows a sectional view of the adaptor assembly of Figure 1, in which the male adaptor and the female adaptor are disassembled.

Figure 4 shows an exploded view of an electrical hole saw adaptor assembly according to a second embodiment of the present invention.

Figure 5 shows a sectional view of the adaptor assembly of Figure 4, in which a male adaptor and a female adaptor are assembled.

Figure 6 shows a sectional view of the adaptor assembly of Figure 4, in which the male adaptor and the female adaptor are disassembled.

Description of Reference Numerals

(10) female adaptor; (20) male adaptor; (21) outer thread; (22) hexagon body; (23) annular groove; (24) through hole; (30) sleeve; (31) inner hole; (32) inner hole; (33) inner hole; (40) inner base; (41) through hole; (42) inner hole; (421) hexagon hole; (43) steel ball; (44) annular protrusion; (45) hexagon hole; (451) hole; (452) steel ball; (453) cylindrical body; (46) hexagon insert; (47) protrusion; (50) spring member; (51) retaining ring; (52) washer; (60) pilot drill bit adaptor; (61) hexagon insert; (611)

annular groove; (62) hexagon recess; (63) steel-ball hole; (64) steel ball; (70) hole saw; (71) threaded hole; (72) circular hole; (80) pilot drill bit; (81) hexagon insert; (82) annular groove.

Detailed Description of the Invention

With reference to Figures 1 and 4, an electrical hole saw adaptor assembly comprises a female adaptor (10) consisting of a sleeve (30), an inner base (40), a spring member (50), a retainer ring (51), a washer (52) and a pilot drill bit adaptor (60), a male adaptor (20), a hole saw (70) and pilot drill bit (80). A threaded hole (71) of the hole saw (70) is locked with an outer thread (21) of the male adaptor (20). The pilot drill bit (80) is provided at the bottom end thereof with a hexagon insert (81) having an annular groove (82).

The female adaptor (10) is assembled in a production line. In the female adaptor (10), the inner base (40) is provided in the periphery thereof with a through hole (41) communicating with an inner hole (42) of the inner base (40). The through hole (41) is filled with a steel ball (43). The outer periphery of the inner base (40) is provided with an annular protrusion (44). The annular protrusion (44) is pressed against a spring member (50), and the inner base (40) is fitted into an inner hole (31) of the sleeve (30). The inner hole (31) of the sleeve (30) is then fitted with a retainer ring (51). Since the retainer ring (51) and the inner base (40) are made of a rigid material and the sleeve (30) is made of a soft material such as aluminum, the retainer ring (51) is tightly fitted with the inner hole (31) of the sleeve (30) so that an interval is kept between the retainer ring (51) and the inner base (40), and the retainer ring (51) stops against the spring member (50). The inner hole (42) of the inner base (40) is provided with a hexagon hole (45). The pilot drill bit adaptor (60) is provided at one end with a hexagon insert (61) having an annular groove (611). The hexagon insert (61) of the pilot drill bit adaptor (60) passes through a washer (52) and inserts into the inner hole (42) so that the hexagon insert (61) is fitted into the hexagon hole (45) of the inner base (40). A cylindrical body (453) of the inner base (40) is provided with a hole (451) for receiving a steel ball (452) to be positioned in the annular groove (611). The cylindrical body (453) is

retained in the inner hole (33) of the sleeve (30) so that the steel ball (452) locks the pilot drill bit adaptor (60) in position. When the cylindrical body (453) is pulled out of the inner hole (33) of the sleeve (30), the pilot drill bit adaptor (60) can be dismounted.

The male adaptor (20) includes a hexagon body (22). The hexagon body (22) is provided thereon with an annular groove (23). The outer thread of the male adaptor (20) is locked with the threaded hole (71) of the hole saw (70).

With reference to Figures 2, 3, 5 and 6, when the male adaptor (20) is dismounted from the male adaptor (10) by the above configuration, the sleeve (30) is merely pulled to press against the spring member (50) while the steel ball (43) is positioned with respect to the larger inner hole (31) of the sleeve (30), so that the male adaptor (20) can smoothly dismounted or mounted. When the sleeve (30) is released, the spring member (50) restores the sleeve (30) in position immediately, and the steel ball (43) is forcibly pressed against the annular groove (23) of the male adaptor (20) in position by the smaller inner hole (32) of the sleeve (30) so that the male adaptor (20) is fixedly incorporated with the female adaptor (10).

As for the engagement of the pilot drill bit with the pilot drill bit adaptor, the pilot drill bit adaptor (60) is provided at the other end with a hexagon recess (62) for receiving a hexagon insert (81) of the pilot drill bit (80). The pilot drill bit adaptor (60) is provided with a steel ball hole (63) for a steel ball (64) to be filled therein. The steel ball hole (63) commutes with the hexagon recess (62). After the hexagon insert (81) of the pilot drill bit (80) is fitted into the hexagon insert (62), the steel ball (64) is positioned in the annular groove (82) on the hexagon insert (81) of the pilot drill bit (80).

With reference to Figure 1, as for the transmission of small power, when drilling a small hole, the inner hole (42) of the inner base (40) in the female adaptor (10) is provided with a hexagon hole (421) to receive the hexagon body (22) of the male adaptor (20). Thereby, the male adaptor (20) is incorporated with the female adaptor (10) by the fitting of hexagon body (22) into the hexagon hole (421) so that power is transmitted through a hexagon insert (46) of the inner base (40) to the pilot drill bit (80), the male adaptor (20) and the hole saw (70).

With reference to Figure 4, as for the transmission of large power, when drilling a large-size hole, the inner hole (42) of the inner base (40) is designed larger in size than the hexagon body (22) of the male adaptor (20). The inner base (40) is provided on its end face with two opposed protrusion (47). The bottom end face of the hole saw (70) is provided with four equidistant circular holes (72) so that the protrusions (47) of the inner base (40) can be engaged correspondingly with two of the circular holes (72). Since the inner hole (42) of the inner base (40) is larger in size than the hexagon body (22) of the male adaptor (20), the engagement of the protrusions (47) with the circular holes (72) can be obtained without interruption.

With reference to Figures 2 and 5, the male adaptor (20) is provided with a through hole (24) through which the pilot drill bit adaptor (60) passes. After the male adaptor (20) is engaged with the female adaptor (10), the steel ball (64) of the pilot drill bit adaptor (60) is stopped against by the through hole (24) of the male adaptor (20) so that the pilot drill bit (80) can not be disengaged from the pilot drill bit adaptor (60) until the male adaptor (20) is dismounted from the female adaptor (10), as shown in Figures 3 and 6, thereby achieving the disengagement of the pilot drill bit (80) from the hexagon recess (62) of the pilot drill bit adaptor (60).

Claims

1. An electrical hole saw adaptor assembly comprising:

a female adaptor (10) consisting of a sleeve (30), an inner base (40), a spring member (50), a retainer ring (51), a washer (52) and a pilot drill bit adaptor (60), an inner hole (31) of the sleeve (30) receiving the inner base (40), the spring member (50) being fitted to an annular protrusion (44) of the inner base (40) and an retainer ring (51) being fitted into the inner hole (31) of the sleeve (30) and pressing against the spring member (50) so that the inner base (40) and the spring member (50) are retained, the inner base (40) being provided with steel balls (43) for mating with the inner holes (31, 32) of the sleeve (30) so as to engage or disengage an annular recess (23) of a male adaptor (20);

a pilot drill bit adaptor (60) having a hexagon recess (62) for receiving a hexagon

insert (81) of a pilot drill bit (80), a steel ball (64) being engaged with an annular groove (82) of the pilot drill bit (80), the steel ball (64) positioning a through hole (24) of the male adaptor (20);

the male adaptor (20) having an outer thread (21) for connecting a hole saw (70), a hexagon insert bit (22), the annular recess (23) and the through hole (24);

the hole saw (70) having an threaded hole (71) for connecting the male adaptor (20); and

the pilot drill bit (80) having a hexagon insert (81) and the annular recess (82);

wherein an inner hole (42) of the inner base (40) is provided with a hexagon hole (421) for mating with the hexagon insert bit (22) of the male adaptor (20) so as to facilitate transmission of the male adaptor (20), a light load on the hole saw (70) and small hole drilling, and by the rapid attachment and detachment between the male adaptor (20) and the female adaptor (10), the hole saw (70) and the pilot drill bit (80) can be rapidly replaced, thereby achieving the effect of transmitting power.

2. An electrical hole saw adaptor assembly comprising:

a female adaptor (10) consisting of a sleeve (30), an inner base (40), a spring member (50) , a retainer ring (51), a washer (52) and a pilot drill bit adaptor (60), an inner hole (31) of the sleeve (30) receiving the inner base (40), the spring member (50) being fitted to an annular protrusion (44) of the inner base (40) and an retainer ring (51) being fitted into the inner hole (31) of the sleeve (30) and pressing against the spring member (50) so that the inner base (40) and the spring member (50) are retained, the inner base (40) being provided with steel balls (43) for mating with the inner holes (31, 32) of the sleeve (30) so as to engage or disengage an annular recess (23) of a male adaptor (20);

a pilot drill bit adaptor (60) having a hexagon recess (62) for receiving a hexagon insert (81) of a pilot drill bit (80), a steel ball (64) being engaged with an annular groove (82) of the pilot drill bit (80), the steel ball (64) positioning a through hole (24) of the male adaptor (20);

the male adaptor (20) having an outer thread (21) for connecting a hole saw (70), a

hexagon insert bit (22), the annular recess (23) and the through hole (24);

the hole saw (70) having an threaded hole (71) for connecting the male adaptor (20); and

the pilot drill bit (80) having a hexagon insert (81) and the annular recess (82);

wherein an inner hole (42) of the inner base (40) is formed as a circular hole to be larger than the hexagon insert bit (22) of the male adaptor (20), and the end face of the inner base (40) is provided with protrusions (47) and the end face of the hole saw (70) is provided with four corresponding circular holes (72) to the protrusions (47) so as to facilitate transmission of the male adaptor (20), a heavy load on the hole saw (70) and large hole drilling by means of the engagement of the protrusions (47) and the circular holes (72), and by the rapid attachment and detachment between the male adaptor (20) and the female adaptor (10), the hole saw (70) and the pilot drill bit (80) can be rapidly replaced, thereby achieving the effect of transmitting power.

Abstract

An electrical hole saw adaptor assembly is provided. The adaptor assembly comprises a female adaptor, a male adaptor, a pilot drill bit and a hole saw. The female consists of a sleeve, an inner base, a spring member, a retainer ring, a washer and a pilot drill bit adaptor. The male adaptor includes an outer thread for attaching to the hole saw, a hexagon insert bit and an annular access. The male adaptor is also provided with a through hole. The hole saw is provided with a threaded hole to be engaged with the male adaptor. The pilot drill bit has a hexagon insert and an annular groove provided on the hexagon insert. By means of quickly mounting/dismounting the male adaptor to/from the female adaptor, the hole saw and the pilot drill bit can be quickly replaced without using a special tool.